Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

years ago Stejneger and Miller called the attention of the Carnegie Institution to the desirability of the exploration of Eastern Asia and showed that it was zoogeographically the most important large area awaiting thorough exploration. Thus the authors have not only shown us what has been done, but also what remains to be done.

GEOGRAPHICAL RECORD

AMERICAN GEOGRAPHICAL SOCIETY

THE DECEMBER MEETING OF THE SOCIETY. A regular meeting of the Society was held at the Engineering Societies' Building, No. 29 West 39th Street, on Tuesday, December 17, 1912, at 8:30 P. M. The Chair was occupied by Vice-President Greenough.

The following persons, recommended by the Council, were elected to fellowship:

Norman L. de Courcey-Burnett,
Max Ferrand,
Edward E. Free,
Robert A. Gardiner,
Sidney Harris,
Geo. B. Herzig,
Jas. S. Higbie,
Wm. S. Long,
William du Pont,
John H. Williams.

The Chairman then introduced Miss Marion Cock, who addressed the Society on "Greece." The lecture was illustrated by numerous lantern slides. On adjournment, the audience had an opportunity to meet Miss Cock in the lower hall.

NORTH AMERICA

PHYTOGEOGRAPHICAL EXCURSION IN THE UNITED STATES. A preliminary announcement has been issued by Prof. Henry C. Cowles of the University of Chicago and Prof. Frederic E. Clements of the University of Minnesota with regard to an international phytogeographical excursion to be held in the United States in August and September, 1913. The excursion is to begin at Chicago about August 1 and close at New York about October 5. Opportunity will be given to participate in local excursions about New York, Washington and Philadelphia. It is hoped that the entire necessary expense for transportation, lodging and subsistence from New York and back to New York will not exceed the sum of $400.

The following features of phytogeographical interest will be studied: near Chicago, examples of the deciduous forests of the eastern United States, the Lake Michigan sand dunes, tamarack (*Larix*) swamps, edaphic prairies and aquatic vegetation; in Nebraska, climatic prairies and salt basins near Lincoln and sand hills near Halsey; the vegetation of the foothills, mesas and mountain parks and of the sub-alpine and alpine region of the Rocky Mountains of Colorado as illustrated in Estes Park, at Colorado Springs and Minnehaha and on Pike's Peak; alkali vegetation, sagebrush (*Artemisia*) desert and irrigated lands near Salt Lake City; mesophytic conifer forests, bogs, salt marshes and marine algae near Seattle, Wash.; sub-alpine and alpine vegetation on Mt. Rainier; the groves of Big Trees (*Sequoia gigantea*), the forests of redwood (*Sequoia sempervirens*), the groves of Monterey cypress (*Cupressus macrocarpa*) and the chaparral of California; the invasion of new territory by desert vegetation near Mecca, Cal.; lowland and highland desert and mountains with transition from desert to conifer forests near Tuscon, Ariz. The itinerary includes the Great Salt Lake, the Yosemite National Park and the Salton Sea. Among institutions to be visited are the University of Chicago, the University of Nebraska, Leland Stanford University, the Carnegie Laboratory at Carmel, Cal., and the Carnegie Desert Laboratory near Tucson, Ariz.

MAP OF PETRIFIED FOREST. The region of the Arizona Petrified Forest was surveyed by the U. S. Geological Survey in 1910, and the resulting map has just been issued. Its title is the Petrified Forest quadrangle. It includes the principal portions of the Petrified Forest National Monument, a reservation created to protect these natural wonders against commercial vandalism, which was making serious inroads into the petrified specimens. The map shows the location and topography of six separate forests, including the famous Petrified Natural Bridge. The fossil trees of these forests had been submerged beneath a heavy covering of soil and then silicified and turned to stone. This stone is exceedingly hard. It is an agate, of many colors, and is susceptible of a very high polish. The Petrified Forest is just south of the line of the Santa Fé Railroad, in Navajo and Apache counties, Ariz., and is reached by wagon road from the town of Adamana.

CITY AND SUBURBAN TEMPERATURES AT NEW ORLEANS. Much interest has been taken in the United States within the past few months in the effect of large cities upon the temperatures observed at regular meteorological stations within their limits as compared with the temperatures recorded at more exposed places near by. The local forecaster of the Weather Bureau at New Orleans, Mr. E. D. Coberly, has compared the twenty-three years of records at the Weather Bureau station in that city with those kept at the Louisiana Sugar Experiment Station at Audubon Park, six miles west of the Weather Bureau office, and about 800 feet from the Mississippi River (*Mo. Weather Rev.*, Vol. 40, No. 4, 1912, pp. 573-574). The mean annual temperature is 0.6° higher in the city. The mean monthly temperatures are also higher in the city in every month except June and July, when the excess at the Park is 0.2° and 0.3° respectively. In October the monthly mean at the Weather Bureau station is 1.5° in excess. The mean maximum at the Park is higher every month in the year, the excess ranging from 0.2° in November to 2.1° in June (2.0° in July). The mean annual maximum is 1.3° higher at the Park.

In the case of the minimum temperatures, the reverse is true, those for the Park being lower, and the difference between the two stations is about twice as great as in the case of the maximum temperatures. The mean annual minimum at the Park is 2.6° lower than at the city station. The difference is greatest in October (4.2°) and November (3.6°). Obviously, the lower minima in the more exposed locality have an important relation to the occurrence of frost in the suburbs of large cities, when the minima in the latter do not fall to freezing. It may here be added that the mean monthly minimum temperatures recorded at the U. S. Weather Bureau office in St. Louis are from 1.5° to 9° higher than those recorded at the Forest Park Observatory, outside of the congested portion of the city.

To sum up in a general way, it appears that (1) the mean annual and mean monthly temperatures at the city station are slightly higher (1.5° at the maximum); (2) the mean maxima in the Park are higher, the greatest excess being about 2°; (3) the mean minima are lower at the Park, the greatest difference being a little over 4°. In other words, these differences are all slight, although perfectly recognizable; they all fall (in the cases here considered) under 4.2°. These results agree very well with the summary given by Hann in his *Handbuch der Klimatologie* (Vol. 1, English translation, pp. 29-30).

R. DEC. WARD.

ADVANCE IN PRICE OF TOPOGRAPHIC SHEETS. The Director of the U. S. Geological Survey recently announced an advance in the price of the topographic sheets issued by the Survey from five cents to ten cents apiece and from $3 a hundred to $3 for fifty copies. This advance took effect on Jan. 1, 1913. Although both the wholesale and retail rates have thus been doubled, the quantity which entitles to the wholesale rate, it will be seen, has been halved. This increase in the price of the topographic sheets, foreshadowed by the advance on July 1, 1905, from $2 to $3 a hundred, is due to a variety of causes. The Director says (*Press Bulletin No. 87, Dec., 1912*): "The constantly increasing refinement in the field work of the topographic surveys, the immense amount of detailed information which is put upon the maps, requiring the most expert and tedious drafting and copper-plate engraving, the great care necessary in insuring the exact register for the three or four color lithographic printings, and the largely increased cost of labor and paper have made the increase in charge not only justifiable but necessary. As a matter of fact, ten or six cents for one of the standard 15-minute topographic sheets of the Geological Survey, which is in effect an almost exact reproduction of about 230 square miles of territory, is a merely nominal price. No comparable maps are issued by any private map-printing house, but if there were they would be sold at $1 to $3 apiece. The field surveying alone of some areas covered by a single map costs more than $5,000, and even $7,000 in very difficult country, while there are few maps which represent an expenditure for field work of less than $3,000."

The U. S. Geological Survey topographic sheets have long been known for their extremely low price, the comparable European maps, in spite of the greater age of the surveying organizations publishing them and the lower cost of labor abroad, being sold at much higher prices. The prices per sheet of some standard European topographic maps are, for instance: one-inch-to the-mile map of the British Ordnance Survey, 25 cents; Karte des Deutschen Reiches, 1:100,000, 36 cents (lithographic transfer, 12 cents); Carte de France, 1:50,000, 32 cents, 1:80,000, 20 cents (zinc transfer, 6 cents); Carta topografica del Regno d'Italia, 1:100,000, 20 and 10 cents, respectively; Topographische Karte der Schweiz (Dufourkarte), 1:100,000, 40 and 20 cents, respectively, Topographischer Atlas der Schweiz (Siegfried-Atlas), 1:25,000 and 1:50,000, 20 cents.

LANDSLIDES IN CANADA. The Geological Survey of Canada is giving attention to the prevention of loss of life through landslides. A landslide at Frank, Alberta, on April 29, 1903, in the Front Range of the Rocky Mountains east of Crowsnest Pass, resulted in the death of seventy persons, in the destruction of some of the houses in Frank, and of one and one-third miles of railroad. Within two months the Canadian Geological Survey had completed a report on the land-slide* in which the causes were said to include the opening of large chambers in a coal mine at the base of Turtle Mountain, from which the slide came. It was recommended that the village of Frank be moved out of danger from future slides. Because the town has not been moved and coal mining has continued to increase the danger, and because large cracks on the mountain have gradually widened, Mr. Brock, Director of the Canadian Geological Survey, again called attention to the danger of the situation in 1909 and 1910. This resulted in the appointing in 1911 of the Commission whose report† is here reviewed.

The report contains an excellent map of the landslide and the area on Turtle Mt. where, it is feared, another avalanche may occur, a careful analysis of geographical and mining conditions in relation to landslides and renewed recommendation that the present town-site be abandoned.

The Commission says there is probability of another slide due to (*a*) special, local conditions favoring a landslide, including topographic, geological, and structural conditions, (*b*) general conditions, such as vibration due to earthquakes, local settling in the mines, or blasting, (*c*) the similarity of natural conditions in 1911 to those preceding the landslide of 1903, (*d*) the position of an adjacent peak left weakened by the 1903 avalanche, and (*e*) the formation of new cracks, showing incipient movement in the peak. They also believe that the influence of continued mining on the stability of Turtle Mountain requires the prohibition of mining in a specified area.

The map by W. H. Boyd, Chief Topographer of the Canadian Geological Survey, 800 feet to an inch, with 25-foot contours, shows the peculiar landslide topography, the extent of the avalanche scar, the topographic conditions on the threatening adjacent mountain wall, and the present extent of fissures. An accompanying map outlines the rock mass now in danger of sliding and gives the approximate area over which such a landslide would extend. This latter includes practically the whole of Frank. LAWRENCE MARTIN.

---

* R. G. McConnell and R. W. Brock: Report on the Great Landslide at Frank, Alberta. Appendix to Part VIII, *Ann. Rept. Dept. Int. for 1902-1903*, Ottawa, 1904. 17 pp.

† R. A. Daly, W. G. Miller and G. S. Rice: Rept. of the Commission appointed to investigate Turtle Mountain, Frank, Alberta, *Mem. 27*, Dept. of Mines, Geol. Surv. Branch, Ottawa, 1912. 34 pp.

ADDENDA TO CANADIAN TOPONOMY. At the suggestion of Mr. Rouillard, secretary of the *Société de Géographie de Quebec,* the minister of lands has given the names of Hanotaux, Lamy, Bazin and Bonin to the new districts formed in the Saint-Maurice region of Quebec province. (*La Géographie,* Vol. 24, No. 5, Nov. 15, 1912.)

HOMESTEADS IN BRITISH COLUMBIA. In a recent address before the British Columbia Conservative Association, held at Revelstoke, Sir Richard McBride, the Provincial Premier, made the announcement that the Government had surveyed 1,000,000 acres along the line of the Grand Trunk Pacific in British Columbia for the sole use of preëmptors, and that by the end of 1913 it would be prepared to offer 160 acres each to 30,000 *bona fide* settlers on preëmptions.

SOUTH AMERICA

SHIP CANAL AT BUENOS AIRES. In connection with the scheme for the enlargement of the port of Bueños Aires, the Senate has passed a bill granting a concession for the construction of the Mitre Canal. The concession, which is for seventy-five years, will have to be ratified by the Chamber of Deputies. The canal will start from the north channel of the port of Buenos Aires and will run along the river front to the mouth of the River Lujan; it will then follow the course of this river for about eleven miles from which point a cutting will have to be made across the islands in order to reach the River Paraná de las Palmas. The first section (to the mouth of the Lujan) will be between 262 and 492 feet wide at the bottom, and its depth will be 29½ feet below mean low river level. The second section will be 144 feet wide at the bottom, and its depth will be 26 feet below mean low river level. Should the canal be constructed much of the distance to the up-river ports will be saved, as well as the heavy pilotage dues now exacted, and these two factors should more than compensate for the payment of the canal dues which the concessionaire is authorized to collect. (Condensed from *Daily Cons. and Trade Repts.,* No. 301, Dec. 23, 1912.)

AFRICA

AFRICAN COTTON PRODUCTION. Egypt is still far ahead of the other African districts where cotton growing has been attempted. The area in Egypt devoted to cotton is over a fifth of the cultivated area, and the product constitutes four-fifths of the total value of exports.

Successful efforts to grow cotton have been made in various European colonies in Africa. In a communication to *La Géographie* (Vol. 24, No. 5, 1912, pp. 336-337), P. Clerget says that during 1908-09 the world production of cotton attained 22½ million bales, of which 21,400 bales were obtained from British African colonies, 4,166 from German African colonies and 740 from French African colonies. Uganda holds the first rank as a cotton producer among the British colonies. Its exports were 3,814 tons in the first three months of 1912, as against 2,945 tons during the corresponding period of 1911. Nigeria and Lagos follow next in order, and it is expected that the 1912 production will reach 12,000 bales. In Nyasaland the plantations are at an altitude between 1,080 and 3,600 feet. The yield from lands owned by the natives now amounts to about 700 tons. In Rhodesia about 5,000 acres have been planted with cotton. Experiments are also being conducted in the Gold Coast colony and in Sierra Leone. In the Anglo-Egyptian Sudan, the yields amount to between 8,000 and 12,000 bales, principally from the Tokar province and from the Suakin and Port Sudan hinterlands. The cotton acreage in this colony may still be easily doubled by irrigation and the valley of the Atbara and the region between the White and Blue Niles may be utilized advantageously. It is likely that the railroad between Khartum and Port Sudan will contribute enormously to the development of this industry.

In the German colonies, the 1911 crop was made up of 5,000 bales from German East Africa and 2,500 from Togoland, as against 2,492 and 1,856 respectively in 1910. It is expected that the 1912 output will exceed that of 1911 by two-thirds.

The French have resumed cotton growing in Algeria where about 451 tons were produced in 1864. The industry, however, was entirely abandoned between 1878 and 1893. Recent attempts appear favorable, both as regards quantity and quality of the product. Experiments are being carried on in Tunis, Senegal, and the inner Niger delta, as well as in the Baule district of the Ivory Coast. The best progress has been achieved in Dahomey where the production increased from a half ton in 1904 to 136 tons in 1909, while the production for all of French Western Africa increased from one ton in 1904 to 177 tons in 1909. Attempts to grow cotton in the island of Reunion are also being made as well as in the French Somaliland and Madagascar.

CULTIVATION OF SISAL HEMP IN GERMAN EAST AFRICA. The British Vice-Consul at Daressalam reports that the cultivation of sisal hemp in German East Africa yields a crop second only to rubber. The plant was introduced from Central America about fifteen years ago, and the exports of fiber have increased from 204 metric tons in 1901 to 7,228 metric tons, valued at about $752,800 in 1910. The plants attain full growth in about seven years, but the first leaves can be cut after three years' growth. In 1911 there were about 47,039 acres planted with sisal in German East Africa, of which about 18,900 acres were productive. The majority of the sisal plantations are in the northern districts of the Tanga hinterland where about 39,500 acres are planted. There are about 4,938 acres in the district of Lindi, to the south, and plantations have recently been opened near the railroad running from Daressalam to Tabora. (Condensed from *Board of Trade Journal,* Vol. 79, 1912, No. 836, p. 519.)

A NEW FRANCO-GERMAN BOUNDARY IN AFRICA. The work of delimiting the new boundary between French Equatorial Africa and the German colony of Kamerun began in December. It is expected that the delimitation of the new boundary will be completed by November, 1913.

ASIA

A RUSSIAN EXPEDITION BY THE NORTH-EAST PASSAGE. A Russian expedition sailed from St. Petersburg in July, 1912, under the leadership of Lieutenant G. Brussilov for a scientific voyage around the Arctic coast of Asia. The vessel secured is Sir Allen Young's old ship, the *Pandora,* which has been renamed the *Saint Anna.* According to the *Geographical Journal* (Vol. 40, No. 6, Dec., 1912), it is proposed to winter at the mouth of a Siberian river, probably the Khatanga, and to complete the North-East Passage during 1913. This route has never yet been followed by a Russian.

EARTHQUAKES IN CHINA. A list of all the earthquakes recorded in Chinese chronicles has been compiled by P. Hoang and published in *Variétés Sinologiques* (No. 28, Shanghai, 1909). Paul Lemoine writes in *La Géographie* (Vol. 26, No. 5, 1912, p. 336), that the list comprises 5,793 earthquakes between 1767 B. C. and 1895 A. D. The Chinese recorders appear to have made a distinction by means of marginal annotations, between "mountain subsidences" and "earthquakes."

NEW POSITION DETERMINATIONS IN ASIA. *The Geographical Journal* (Vol. 40, Dec., 1912, pp. 624-628), has a table containing the latitudes, longitudes and altitudes of a number of the most important places explored by Mr. Cecil Clementi, assistant Colonial Secretary at Hongkong, on his journey from Kashgar to Hongkong in 1907-08. The length of the route between these two places is about 3,990 miles. Altogether 141 places were fixed in latitude, 139 in longitude, while the altitude of 185 places was determined. It is proposed that a detailed description of this important journey shall be published later as a separate volume, out of the notes and maps sent by Mr. Clementi to the Royal Geographical Society. The list of place and height determinations is reproduced below, omitting remarks:

PLACE-NAMES.	LATITUDE NORTH.			LONGITUDE EAST.			HEIGHT ABOVE SEA-LEVEL IN FEET.
	°	''	'	°	'	''	
Kashgar	39	28	45.1	75	58	0.0	4213.0
Maral-bâshe	39	46	41.5	78	6	20.2	3886.7
Ikül	40	55	2.8	79	43	3.5	3675.6
Aksu (Chinese city)	41	7	57.2	79	55	25.2	3894.1
Bâi	41	46	58.6	81	58	22.3	4177.8
Kwazil	41	49	14.9	82	39	5.5	4068.4
Kuchar (Mahd. city)	41	43	49.1	83	7	55.7	3611.6
Kôrlâ	41	44	20.8	86	10	10.4	3463.1
Karashar	42	3	35.1	86	35	40.6	3471.4
Tabalghi	42	15	13.9	86	51	13.9	3627.2
Turfan	42	56	1.1	89	6	3.0	97.2
Urumchi	43	48	3.2	87	46	15.7	2736.7
Ku-mu-ti	43	57	40.7	87	50	2.8	1910.2
Tz'ŭ-ni-Ch'üan	44	11	50.0	88	29	35.4	1632.8
Hami	42	48	34.9	93	18	16.2	2140.5
Huang-lung Kang	42	45	6.1	93	44	34.3	2106.9
K'u-shui Yi	42	2	49.8	94	26	25.4	3140.7
An-hsi Chou	40	32	25.7	95	47	20.6	3410.2
Su Chou	39	44	27.1	98	26	56.3	4604.7
Hei-ch'üan P'u.	39	31	12.4	99	30	22.9	4097.4
Kan-chou Fu	38	55	41.4	100	21	29.6	4642.5
Tung-loa Fên Hsien	38	49	18.6	100	48	14.7	4726.5
Shui-ch'üan P'u	38	22	54.9	101	40	5.8	6915.8
Yung-ch'ang Hsien	38	15	19.6	101	56	2.3	6071.4
Ching-pien Yi	37	40	50.8	102	45	8.6	5577.3
Chên-ch'iang Yi	37	9	3.5	102	53	29.4	8583.8
K'u Shui	36	15	5.4	103	25	14.3	5193.9
Lan-chou Fu	36	3	11.4	103	46	7.1	4806.8
Li-chia P'u	35	28	19.0	104	45	0.1	6211.1
Kuoa-chia Chên	34	58	17.7	105	23	41.8	4195.9
Ch'in Chou	34	35	34.8	105	33	45.6	3707.8
Hui Hsien	33	45	29.9	105	53	42.1	3027.8
Loa-yang Hsien	33	19	52.7	106	3	31.0	1939.1
Chien Chou	32	0	53.7	105	43	55.2	1393.7
Hsiao-han Chên	31	3	2.0	104	28	4.3	1512.6
Hsin-tu Hsien	30	49	31.3	104	17	38.1	1692.6
Ch'êng-tu Fu	30	37	52.9	104	19	23.9	1734.7
Ch'ung-ch'ing Fu	29	32	8.0	106	32	45.0	750.0
Ch'i-chiang Hsien	29	1	54.0	106	40	7.3	994.6
Sung-K'an Ch'ang	..	..	...	...	..	...	1226.2
Hou-pa Ch'ang	27	30	14.0	107	1	28.6	2870.6
Hsi-fêng Ch'ang	..	..	...	...	..	...	3535.1
Ku-t'ung Kai	26	28	32.4	107	35	28.4	3678.6
Pa-chai T'ing	26	12	28.1	107	51	58.8	3456.6
Ssŭ-lung Kai	25	52	3.0	109	12	58.4	......
Lung-shêng T'ing	25	48	1.6	109	30	48.5	723.7
Kuei lin Fu	25	18	0.0	110	10	7.0	506.3
Fêng ch'ung T'ang	24	15	57.2	110	35	30.1	167.9
Wu-chou Fu	23	27	21.5	111	16	6.0	20.0
Canton	23	6	9.0	113	16	2.0	± 0
Shek-lung	23	6	28.1	113	52	11.7	± 0
Kowlun	22	18	13.2	114	10	27.9	± 0

EUROPE

GENERALIZATION OF THE DECIMAL SYSTEM IN FRANCE. In a report addressed to the Minister of Commerce and Industry, the *Comité pour la Propagation des Méthodes Décimales* of Toulouse recommends the adoption of the decimal subdivision of the day as well as that of the circular quadrant. The report says that the growing use of time as a factor in modern activity appears to necessitate its subdivision in units that lend themselves to ready computation. Tests made on a decimal watch during 1910 and 1911 by the Club Nautique at Nice showed plainly how the use of this base would simplify time calculations. At present the use of decimal time is confined to astronomers who have deemed it expedient to follow the example set by Laplace.

"The adoption of the decimal base as a system of angular subdivision will tend to simplify in a large measure current geodetic, cartographic and nautical computations. In practice the system has the advantage of establishing a simple ratio between angular and linear measures, since, on the surface of the earth, the length of a centigrade-arc is equal to 1 kilometer. The value of this relation both for purposes of ready retention by the memory as well as in ordinary calculation needs no comment. Its superiority over the ratios resulting from the use of the nautical or standard mile is likewise obvious. Neither is it necessary to dwell on the convenience afforded by the use of the same unit of length at sea and on land." * LEON DOMINIAN.

AN INTERNATIONAL CONGRESS OF FORESTRY. An International Forestry Congress will be held in Paris, June 16-20, 1913, under the auspices of the Touring Club de France. The programme is divided into five sections, *viz.*:— (1) sylviculture; (2) forest economics and forest laws; (3) forest technology, including uses and preservation of wood, its by-products, etc.; (4) afforestation, its advantages, etc.; (5) the value of the forest in developing touring and esthetic education. (*Board of Trade Journal,* Vol. 79, No. 836, Dec. 5, 1912.)

OBITUARY

FRANÇOIS ALPHONSE FOREL. The death of Professor François Forel, on Aug. 7, 1912, has removed the founder of the modern science of limnology. Born at Morges on Lake Geneva, in 1841, the great sheet of water became the subject of enthusiastic researches to which he devoted most of his life. In the volumes of "Le Leman" he reared his own monument and his "Handbuch der Seenkunde" demonstrated his ability to generalize facts common to all lakes. His literary style was charming and clear. He followed with intense interest our growing knowledge of seiches which was so much extended by the studies of the late Professor Chrystal and other members of the Survey of the Scottish lochs. His excellent work in the study of Swiss glaciers, and in seismology, enhanced his reputation.

PAUL LE MARINEL. *Le Mouvement Géographique* (Vol. 29, No. 48, Dec. 1, 1912), reports the death on Nov. 29, 1912, of Commandant Paul Le Marinel at the age of 54. He was the first Belgian to penetrate the Katanga district. He was particularly familiar with the Congo, where he began his career as a topographer in 1885. He founded the Lusambo outpost on the Sankuru River in 1888. This locality subsequently became his headquarters for the exploratory work he undertook in the Bena-Kamba region along the Lomani River. In 1893 he was appointed State Inspector for the districts of Stanley-Pool, Kasai, Eastern Kwango and Lulaba. He resigned from the army and the service of the Congo Free State in 1906.

GENERAL

EXPERIMENTS ON THE PROPERTIES OF ICE. One of the last phases of scientific work of the late Professor R. S. Tarr was a laboratory investigation of the properties of ice, in an attempt to find out the nature of the movement of glaciers (R. S. Tarr and J. L. Rich, The Properties of Ice—Experimental Studies—*Zeitschrift für Gletscherkunde,* Band VI, Heft 4, April, 1912, pp.

---

* Rep. 8th Int. Geogr. Cong. 1904, pp. 571-573.

225-249). These studies were carried on during the winter of 1910-1911, and were continued by the senior author in field observations in the summer of 1911, and by laboratory studies in the winter of 1911-1912, which were terminated by his lamented death in March, 1912. It may be stated now, however, that this second winter of laboratory observations, which were most fruitful in connection with the nature of glacier movement, will be described later from the author's notes.

The experiments of the first winter are partly a repetition of earlier physical investigations and partly new lines of investigation. In connection with them, Tarr and Rich carried on optical studies of the ice used, devised new apparatus for their investigations, and even sent several thousand miles from Ithaca to the Selkirk Mountains in Canada for glacier ice with which to make studies.

Their examinations were along the lines of (a) regelation, (b) crushing tests, (c) welding tests, (d) experiments in deformation, and (e) high pressure experiments. The regelation tests confirmed well-known experiments, and showed that the ice cut through by a wire loses little or no strength thereby, and that the optical orientation along the path of the wire is undisturbed. The crushing tests, even at temperatures above freezing, brought out variations related to (1) the rate at which the load was applied, (2) the direction of the crystals, (3) yielding as a result of pressure melting during the application of the load, and (4) the flowage of the ice under the load. The welding tests brought out a doubt as to the probability of pressure melting. The experiments in deformation led the authors to advance four tentative propositions.

"1. The deformation is in the nature of plasticity; that is, a certain minimum stress is required for its initiation. Until this stress is reached there will be no permanent deformation. This plastic yield point lies near the breaking point of the ice.

"2. The ease with which deformation may be produced varies with the direction in the crystal.

"3. The optical properties of a crystal are affected by such deformation, the effect being dependent upon the direction in the crystal in which the deformation takes place.

"4. Granular ice, composed of interlocking crystals, is subject to deformation equally with a single ice crystal."

The high pressure experiments confirmed the knowledge (1) that ice readily flows under pressure, (2) that snow can be changed by pressure.

The outdoor, winter conducting of these experiments, the making, from snow and from pond-ice, of ice that was optically indistinguishable from the glacier ice of the Illecillewaet Glacier, with its undulatory extinction, mark these experiments as of unusual interest, and the publication of the results of Professor Tarr's later, and unfortunately his last, experiments will be eagerly anticipated by students of glaciology. LAWRENCE MARTIN.

THE LIVINGSTONE CENTENARY, 1913. The Royal Geographical Society will hold a meeting in commemoration of the birth of David Livingstone on March 17, 1913, when Sir Harry Johnston will give an address, and an exhibition of relics associated with Livingstone's work will be arranged. It is hoped that Sir John Kirk, the only survivor of the expedition of 1858-64, will be present. The celebrations of a more general character throughout the country will include a national memorial service in St. Paul's Cathedral on March 19, the anniversary of the explorer's birth, and, in the evening of the same day, a national demonstration at Albert Hall. The speakers at this meeting will include Lord Balfour of Burleigh, Sir Harry Johnston, Dr. Wardlaw Thompson (senior Foreign Secretary of the London Missionary Society, under whose auspices Livingstone first went to South Africa), and Bishop Tucker of Uganda. Special celebrations will be held at Glasgow, both by the University, which claims the explorer as a former student and graduate; by the Elgin Place Congregational Church of which he was a member; and by the municipality. (*Geographical Journal*, Vol. 40, No. 6, Dec., 1912.)